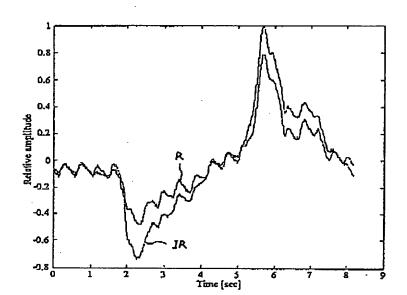


3: light source driver
4: living tissue
7: multiplexer
8-1, 8-2: filter
9: A/D converter
10: processor

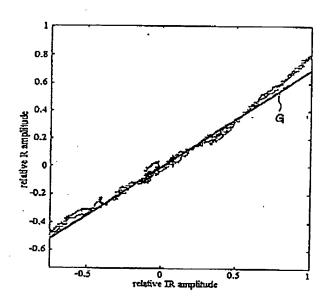
Masaru YARITA Q78282 SIGNAL PROCESSING METHOD..... Filing Date: October 30, 2003 Darryl Mexic 202-663-7909 2 of 11

Fig. 2



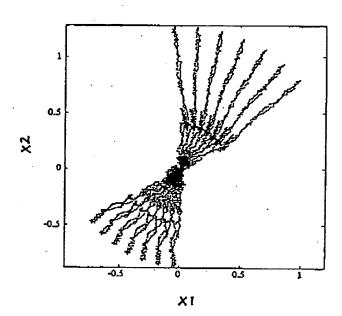
Masaru YARITA. Q78282
SIGNAL PROCESSING METHOD.....
Filing Date: October 30, 2003
Darryl Mexic 202-663-7909
3 of 11

Fig. 3



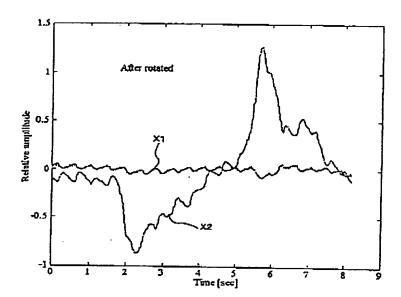
Masaru YARITA Q78282 SIGNAL PROCESSING METHOD..... Filing Date: October 30, 2003 Darryl Mexic 202-663-7909 4 of 11

Fig. 4



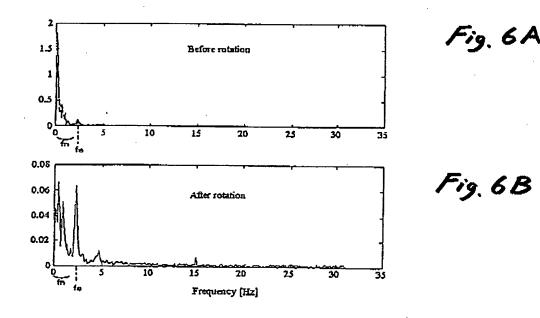
Masaru YARITA Q78282 SIGNAL PROCESSING METHOD..... Filing Date: October 30, 2003 Darryl Mexic 202-663-7909 5 of 11

Fig. 5



Masaru YARITA Q78282

SIGNAL PROCESSING METHOD.....
Filing Date: October 30, 2003
Darryl Mexic 202-663-7909
6 of 11



1.6.7

1: start measurement

S2: detect pulse wave signals pertaining to infrared light and red light

S3: obtain ratio of pulsation component to DC component for each pulse wave signal

S4: obtain noise-reduced waveform by processing respective pulse wave data with rotating matrix (rotating angle is predetermined)

S5: obtain fundamental frequency by frequency analysis with respect to noise-reduced waveform for given time period

S6: obtain and display pulse rate

そのし2ノルム比

8

L2ノルム値を 状め、その比を

来める

ノイズが低強された故形を

命る.

データを処理し、

所定期間分の赤外光脈波と赤色光脈波のそれぞれが

子め回転角が設定された

回転行列により、

赤外光脈故と赤色光脈弦の

赤外光の駅後、赤色光の駅後

を被出

湖定開始

それぞれの脈波の宮部成分に対する脈動成分の比を求める。

B

酸素飽和度 Sp02

を状める.

基本周波数を求める。

町被数解析し、

かるとい

ノイズが低減された故形を

所定期間分の

S7: obtain L2 norm values from respective pulse wave signals of given time period and obtain ratio thereof

S8: obtain oxygen saturation from L2 norm ratio

S9: display oxygen saturation

S10: measurement is continued?

酸紫飽和度 SpO2 を

SS

数示部に表示する

脈始数を求めて、 表示部に表示する 初

河丘松桃

ş

遊玩歌了

S11: ferminate measurement

FS: 80

31: start measurement

52: detect pulse wave signals pertaining to infrared light and red light

3: obtain ratio of pulsation component to DC component for each pulse wave

S4-1: obtain rotating angle from respective pulse wave data for given time period

S4-2: obtain noise-reduced waveform by processing respective pulse wave data with

rotating matrix corresponding to obtained rotating angle

S5: obtain fundamental frequency by frequency analysis with respect to noise-reduced waveform for given time period

S6: obtain and display pulse rate

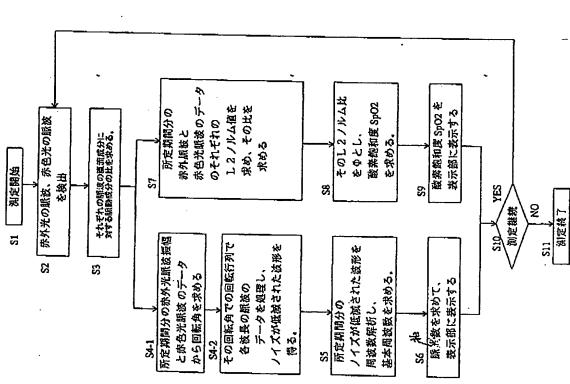
S7: obtain L2 norm values from respective pulse wave signals of given time period and obtain ratio thereof

S8: obtain oxygen safuration from L2 norm ratio

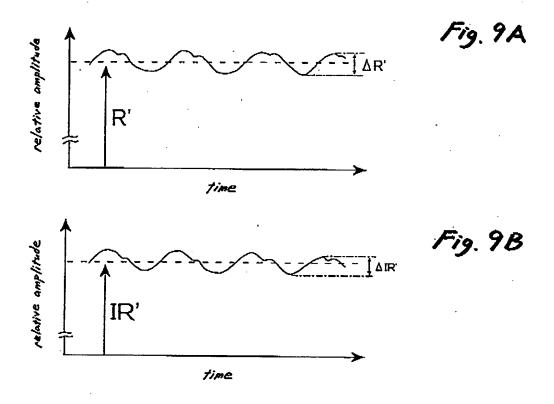
9: display oxygen saturation

S10: measurement is continued?

S11: terminate measurement



Masaru YARITA. Q78282
SIGNAL PROCESSING METHOD.....
Filing Date: October 30, 2003
Darryl Mexic 202-663-7909
9 of 11



start measurement

detect pulse wave signals pertaining to infrared light and red light

obtain ratio of pulsation component to DC component for each pulse wave

obtain noise-reduced waveform by processing respective pulse wave data with

rotating matrix (rotating angle is predetermined)

S5: obtain fundamental frequency by frequency analysis with respect to noise-reduced waveform for given time perlod

obtain and display pulse rate

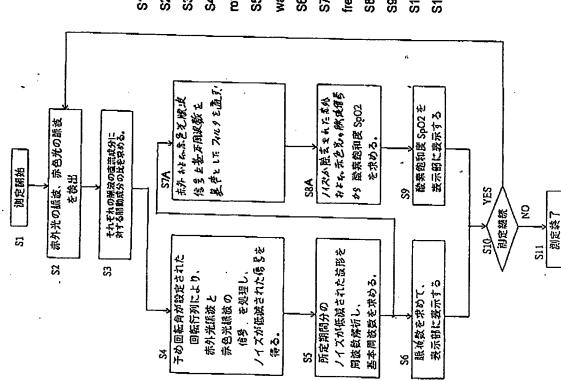
pass respective pulse wave signals through filter associated with fundamental frequency to obtain noise-reduced pulse wave signals

obtain oxygen saturation from ratio of noise-reduced pulse wave signals

display oxygen saturation

measurement is continued? S10:

S11: terminate measurement



Masaru YARITA Q78282 SIGNAL PROCESSING METHOD..... Filing Date: October 30, 2003

Darryl Mexic 202-663-7909 11 of 11

赤外光の脈弦、赤色光の脈波

S

が物田

遊定開始

S

それぞれの怒波の回転収分に 対する脈即成分の比を求める。

S

start measurement

detect pulse wave signals pertaining to infrared light and red light

obtain ratio of pulsation component to DC component for each pulse wave

S4-1: obtain rotating angle from respective pulse wave data for given time period

英学と377ペタを通う。

その回転角での回転行列で

ノイズが低波された依分で

等る。

ゆる、を処理し、

各故長の服故の

信号在基本图及数三

赤やかよな赤の光配板

STA

所定期間分の赤外光脈後短幅

と赤色光賦汝のデータ

から回転角を求める

8.5

obtain noise-reduced waveform by processing respective pulse wave data with rotating matrix corresponding to obtained rotating angle

S5: obtain fundamental frequency by frequency analysis with respect to noise-reduced waveform for given time period

S6: obtain and display pulse rate

pass respective pulse wave signals through filter associated with fundamental frequency to obtain noise-reduced pulse wave signals S7A:

obtain oxygen saturation from ratio of noise-reduced pulse wave signals S8A:

display oxygen saturation . 89:

:

おからは色光の脱液便野

ノイズが低級された政形を

所定期間分の

જ

5 酸萘飽和度 Sp02

を状める。

基本関放数を求める。

固妆敷除柜 D.

14天" 45 股至 54 元 本外

% ₹

measurement is continued?

terminate measurement

政務飽和度 SpO2 を 扱示部に表示する

表示的に設示する

原格数を求めて、

SS

YES

買定指統

三级沙河

S